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Resource Management, Inc.

"Environmental Solutions from a Practical Perspective"

November 12, 2004

Mr. Bruce Schuld,
Mine Waste Projects Coordinator
Idaho Department of Environmental Quality (IDEQ)
1410 North Hilton Street
Boise, Idaho 83706

Subject: Revised Submittal of Centennial Mine Project Small Mineral Cyanidation Processing Facility Application – Response to IDEQ Application Review Comments

Dr. Mr. Schuld:

Enclosed are three (3) copies of Desert Minerals Mining, LLC (DMM) Revised Cyanidation Processing Application for their small mineral processing facility to be located near Blacks Creek in western Elmore County, Idaho. The application is being submitted by RTR Resource Management, Inc., as the agent for DMM.

As you suggested in your October 22, 2004 letter which was received October 26th via fax, the submittal includes detailed engineering plans and technical specifications. Mr. Rick Frechette of RTW, Inc., Elko, Nevada prepared the technical information, under the direction of RTR. The design is signed by a registered professional engineer in the State of Idaho.

You will note that the new submittal responds to all other technical comments and supplemental information requests in you October 22n letter. Special attention was directed to the monitoring plan, indicator parameters, and spill contingency considerations. We have eliminated the land application proposal for dealing with potential "extraordinary" water management issues, at your recommendation.

We appreciate you continued diligent commitment to evaluate our proposal in a timely manner. Mr. Frechette was able to visit the site last week, and six (6) excavations were made with a backhoe in the area where the processing plant and tailings impoundment will be located. This data was considered in developing the detailed engineering plans and specifications. The geotechnical data results and interpretation will be submitted to IDEQ under separate cover next week. You indicated that this is an acceptable approach, and that it will have no effect on the restart of the review time clock

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Also, the Reclamation Plan agency comments are undergoing concurrent review, and RTR is addressing comments made by the Idaho Department of Lands and IDEQ at this time. A revised plan will be submitted early next week.

Please call me if you have any questions. As you know, we are up against a very tight construction window, and will respond promptly to your needs.

Sincerely,

Robert I. "Rick" Richins,
Principal

CC: Dan Terzo, DMM

Attachments: Revised Cyanidation Processing Application (3 copies)

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1.a Name, Location, and Mailing Address of Facility & Contacts

Desert Mineral Mining, L.L.C. (DMM)
Centennial Mine Processing Facility
Section 13, Township 2 North, Range 4 East
Elmore County, Idaho

Mine Mailing Address/Contact is:
Mr. Dan Terzo
Desert Minerals Mining, L.L.C.
327 Aster Street
Laguna, Beach, CA 92651

Environmental/Permitting Contact is:
Rick Richins
RTR Resource Management, Inc.
1109 W. Main Street; Suite 480
Boise, Idaho 83706

1.b Name, Mailing Address and Phone Number of Applicant / Registered Agent

Daniel J. Terzo, President, CEO
Laguna Pacific Partners, LLC
327 Aster Street
Laguna Beach, CA 92651

Office: (949) 464-9128
Cell Phone: (714) 403-7858
Fax: (949) 464-9502

1.c Location and Land Ownership Status of Facility

Private: Patented Mining Claims (See Figures 1 and 2, Land Location Map and Land Ownership and Road Access Map)

1.d Legal Structure and Residence of Applicant

Limited Liability Corporation
Laguna Pacific Partners, LLC
327 Aster Street
Laguna Beach, CA 92651

SECTION 2 - OVERVIEW OF THE PROPOSED SMALL MINERAL CYANIDATION PROCESSING FACILITY

2.a Mineral Processing Facility

The small mineral processing facility would process up to 100 tons per day (tpd) or 36,500 tons per year (tpy) using a totally-contained cyanidation/milling process. The project could operate up to 5 years, and process up to 120,000 tons of ore over the life of the operation. The facility includes an internal vibratory mill employing two grinding nits. The closed Thompson Mill system would be located in a secondary containment area (cement with berm or "stem" walls) process building. The general site for the facility is located on patented land, and is also shown in Figure 2. The process facility is powered by diesel generation (65kw with 35kw back-up). It includes: 2 hydrocyclones, a cyanide dissolution retention tower, and an activated carbon filter process involving 5 columns. All barren, pregnant and makeup solutions are contained in internal tankage. The Thompson mill will be mounted on two 16-feet double axle trailers. The basic general process flowsheet is shown in Figure 3 (Process Design Flowsheet Proprietary).

Gold-loaded carbon columns are stripped in an alcohol liquor tank. Gold is then plated onto steel wool by electrowinning at the site. The plated steel wool is melted onto separate steel from the gold.

Prior to discharge of spent ore into the tailings impoundment, the tailings are treated (neutralized) with sodium hypochlorite. This treatment renders the tailings inert. The results of a waste characterization/toxicity analysis will be provided to the Idaho Department of Environmental Quality (IDEQ) as part of initial plant commissioning process.

2.b Tailings Impoundment

A phase 1-36,500 ton capacity initial tailings impoundment has been designed for the project. This tailings storage facility is located immediately south of the pilot process plant. A general facilities siting arrangement is shown in Figure 4. The tailings impoundment is rectangular and configured as a cut-to-fill structure that would be suitable for most any gently sloping site. The exact optimized location is currently being optimized, based on geotechnical investigations (backhoe excavations) at the plant site. The perimeter berm of the tailings facility is constructed of fill excavated from the interior of the storage facility. The impoundment is lined with 60-mil HDPE geomembrane over a prepared sand-like base. The base will be prepared in place by scarification, moisture conditioning and compaction, with removal of oversized particles (see Appendix 1, Detailed Technical Specifications for Constructing Tailings Storage Facility). If suitable relatively fine-grained material is not present for the facility foundation, a heavy-duty non-woven geotextile fabric will be placed over the prepared subgrade to protect the lining system. The engineering design plan is shown in Figure 5

(Detailed Engineering Design Plan for Constructing Tailings Storage Facility-Layout View).

Figure 5 illustrates the general tailings facility design based on a planar site configuration with an approximate one percent unidirectional existing grade. The cell interior is approximately 420 feet by 250 feet (Figure 6, Detailed Engineering Design Plan for Constructing Tailings Storage Facility- Cross Section). The perimeter berm has a 15 foot crest width and 3:1 (H:V) side slopes on both sides. The facility is 11.5 feet deep and holds approximately 10,000 tons of tailings with operating freeboard. The perimeter berm height above existing grade is less than 8 feet, which falls beneath the jurisdictional dam height status.

The berm will be compacted in lifts and the finished interior surfaces of the tailings facility will be mechanically prepared for liner installation. A suitable geotextile will be installed over subgrade to protect the liner, if available soil resources are not of appropriate texture.

✓ 2.b.1 Operation and Reclamation of the Tailings Facility

The tailings will be discharged into the tailings impoundment from multiple spigot points around the perimeter. By managing the discharge from various points, the tailings can be placed in thin lifts with maximization of water recovery and evaporation, thus minimization of water retention and maximization of density. The initial tailings impoundment configuration is expected to allow for approximately 36,500 tons of containment for the initial small scale test program. The design also provides for at least 2 feet of freeboard for contingency precipitation event containment.

The tailings impoundment will be reclaimed by regrading the remaining protruding portion of the crest of the berm into the impoundment area, and placing growth medium salvaged from the facility construction footprint over the final surface. The finished surface will be seeded and fertilized to promote vegetation establishment. A more detailed description of the total project reclamation strategy is included in the document: Reclamation Plan for the Centennial Mine Project, RTR Resource Management, Inc., dated October 2004 and submitted to the Idaho Department of Lands.

✓ 2.b.2 Expansion Potential

The proposed tailings facility design could be duplicated to double the tailings storage capacity. By careful siting the initial facility appropriately, a second impoundment can be constructed adjacent to the first, making use of one of the Facility 1 berm segments, creating a common berm. Facility 2 could be situated immediately adjacent to Facility 1, on either the north or south side of the

impoundment. The adjacent facility berm would become common to both impoundments.

The layout and construction of a second facility would be virtually identical to the first. Operation and reclamation of a second tailings impoundment would also follow the pattern previously described for the first facility. Retention of the first tailings impoundment in a non-reclaimed state over the life of a second facility would provide additional operational flexibility, as well as advantages for water management.

At this time, only Facility 1 is planned. DMM will evaluate the feasibility of constructing Facility 2 of the project during Facility 1 operations.

2.c Crushing

The basic crushing flowsheet is also generally summarized in Figure 3, and includes the following: vibrating grizzly sorting the feed to jaw crusher, two conveyors, and a surge pile with variable speed screw feed to fine crushed ore bin with vibrating feeder. The system would be portable, and crush to 3/8 inch minus for optimum milling performance.

DMM is currently evaluating crusher alternatives. One option would involve batch crushing at the minesite by a permitted portable source contractor. A second alternative would involve installation of a small permanent jaw crusher at the site, including water sprays at the feeder.

Air quality modeling for a 375,000 ton per year mining operation was modeled in 1990 by TRC Consultants. This information will be utilized in obtaining necessary air quality permits for the small scale processing facility.

2.d Chemical Usage

Chemical reagents for the processing plant will be stored in a separate building on a lined (concrete) surface. All chemicals will be stored according to appropriate federal regulations, and separated as appropriate (i.e., sodium cyanide and nitric acid). A list of primary milling and processing is provided below:

- Sodium Cyanide
- Calcium Oxide (lime)
- Flocculants
- Carbon
- Iron Slugs (Fe)
- Ethanol
- Sodium Hypochlorite

An estimate of chemical usage per ton of ore is as follows:

Chemical	1 ton/hour	24/ton/day	100 ton/day
Sodium Cyanide	0.28 lb.	6.72 lbs.	28 lbs.
Calcium Oxide (lime)	8.67 lbs.	2.08.08 lbs.	867 lbs.
Flocculants (minor)	0.06 lb.	1.44 lbs.	6 lbs.
Carbon (minor)	0.02 lb.	0.48 lbs.	2 lbs.
Iron slugs (Fe)(minor)	0.02 lb.	0.48 lbs.	2 lbs.
Ethanol (minor)	0.02 lb.	0.48 lbs.	2 lbs.
Sodium Hypochlorite	TBD	TBD	TBD

Note: Final quantities to be determined as part of small scale test program. "Minor" indicates low hazard to workers and environment.

The Thompson Mill utilizes limited chemicals by design. All chemical reagents will be stored according to applicable state and federal regulations.

Included as Appendix 2 are Material Safety Data Sheets (MSDS) for all chemicals to be used at the site. Fuel and other deleterious materials or wastes transported to and from the millsite will be included in a discharge response plan (DRP), which will be included in a formal Spill Prevention Containment and Countermeasure Plan (SPCC Plan) to be submitted to IDEQ prior to startup of the processing facility. A preliminary list of key reagents and MSDS are provided later in Section 5 of this document. Bills of lading will be kept onsite, along with all MSDS sheets; this information will be available for inspection by IDEQ. A general description of handling procedures and protocol for important materials is described in summary below:

- Used Oil – Used motor oil from the generator, trucks and loader used in the mining operation are expected to be less than 10 gallons in any month. Used oil will be stored in closed containers inside a protective berm at the millsite. DMM will make necessary arrangements for regular pick-up (and/or delivery by DMM) by a licensed used oil service.

- Sodium Cyanide – Sodium Cyanide (about 28 lbs/day; 200 lbs/week) will be stored in a locked area inside the plant, separated from any other chemicals. The storage area will be adequately ventilated. No more than 1500 lbs. (about 60-day's needs) will be stored at the site at any given time. Inspection access will be provided by DMM to IDEQ at any time during regular operating hours.

- Flocculants – Less than 250 lbs of flocculants will be stored at the site at any given time. It will be stored either in 5-gallon buckets, or 55 gallon drums inside a lined berm area to ensure that no unauthorized discharges occur.

- Lime – Dry lime (calcium oxide) will be used in the process for pH control. It is assumed that about 6000 lbs. will be used each month to maintain the necessary high pH controls. Lime will be stored in the same area as sodium cyanide, but in a separate container (metal box). It will be shipped to the site in bags.

- Sodium Hypochlorite – A 30% water mixture would be used to neutralize spent cyanide-treated ore (tailings), prior to discharge to the tailings impoundment. About 1000 lbs. is the maximum quantity to be stored onsite at any given time. It will be stored in a locked area near the sodium cyanide supply.

- Acids – All forms of acids will be prohibited from the location where sodium cyanide is stored.

2.e Water Supply

Water supply will be by ground water wells (local); DMM will purchase water supply from current water right user.

2.f Electric Power

Power is provided by a two diesel-powered generators estimated at 65KW and 35KW (Caterpillar or similar) with backup emergency generator available to circulate cyanide process water.

2.g Fuel Storage

Diesel storage at the site will not exceed 1320 gallons. All diesel and gasoline fuels will be stored in above ground tanks near the tailings storage facility (west side). Fuel tanks will be located inside a bermed, HDPE (or similar) lined containment area. It will be fenced, gated, and located at all times.

2.h Access

Access is via existing private maintained dirt/gravel access road (see Figure 1, Land Ownership and Access Map). Fencing will be located around the plant, tailings facility, and fuel containment area. The access will be gated.

2.i Security

The process area would be fenced and locked at all times. DMM will have trained personnel onsite at all times during operations. The tailings storage facility fencing will also be deer-proof fencing.

SECTION 3 – OVERVIEW OF SURFACE AND SUBSURFACE CONDITIONS DESCRIPTION

3.a Climate

The National Oceanic and Atmospheric Administration (NOAA) has a climatologic station at Arrowrock Dam, located approximately 6 miles north of the project site. The elevation at Arrowrock Dam station is 3,275 feet. The average annual total precipitation for this station is 18.82 inches for a period of record from 1912 through 1987.

Based on a revised Idaho Average Annual Precipitation Map, the average annual precipitation at the site is estimated at 18-20 inches. The revised map represents a wetter period of record than occurred for the previous period of record from 1930 through 1957. The previous annual precipitation at the site, as estimated for that period, is 10-15 inches. Arrowrock Dam has an average annual precipitation of 19.45 inches (NOAA, 1990).

The annual free water evaporation for the Blacks Creek and Wood Creek drainages is approximately 19 inches (Hydro-Geo Consultants, Inc., 1990). The mean annual pan evaporation rate is on the order of 42 inches per year (Geowest, 1989). The area is a net evaporation area. The 100 year, 24-hour storm event is 2.8 inches. This was calculated by Hydro-Geo Consultants, Inc. in 1990.

3.b Land Surface

Copies of aerial photographs of the mine site are included as Appendix 3 of this document. Significant previous mining disturbance has occurred at the site. The following narrative is provided:

a. All wells, springs, wetlands, surface waters and irrigation ditches within one (1) mile of property – All springs and seeps and ephemeral surface waters are shown on Figure 7. No wetlands exist at the processing facility site. The location is high in the drainage. It does not drain to Wood Creek. Likewise, no irrigation ditches are located within one (1) mile of the property boundary.

b. All USGS identified floodplain areas – No USGS mapped floodplains occur at the minesite.

c. All buildings and structures within a half (½) mile of the site boundary – No buildings or structures occur within the ½ mile perimeter.

d. All Special Resource Waters within one (1) mile of the site boundary – None are located within one mile of the project.

The proposed small scale mineral processing facility will be located approximately 25 road miles east of Boise, Idaho in Township T2N, Range R4E, Section 13, in Elmore County, Idaho (see Figure 1, Location Map). The site is located between elevations of 4500 and 4800 feet. The area is in a mountainous region. Topographic relief at the site varies greatly, but generally slopes towards the south and southwest from approximately 6% to 17% in the drainages, and 15% to 40% on the hillsides. The site of the proposed processing facility is flat. Vegetation consists primarily of brush and low grasses at the processing site. Widely scattered trees are dominant in the shallow drainages.

The general geology of the area consists of exposures of granites and grandiorites of the Idaho Batholith. Depth of bedrock in the flat areas is shallow (typically one to five feet), and covered with a thin veneer of silty sand to slightly clayey sand colluvium. The lower lying areas contain 12 to 30 inches of dark gray to black topsoil consisting of silt to fine sand with organics. The major local ephemeral drainages contain sandy alluvial soils to depths of 10 to 25 feet.

The subsurface conditions in the area where the small scale processing facility would be located were investigated in 1989 by drilling five (5) boreholes. These borings were located in the general area where a leach pad and surge pond were planned to be sited for a full-scale heap leach operation. In addition, three (3) holes were drilled around the area where DMM is proposing to locate a small waste rock storage site. Two locations, GW-E and GW-F were converted to monitoring wells. These groundwater sites would be re-activated for the DMM processing plant proposal as monitoring wells.

Borings and test pits indicated that the surge pond site located just south and west of the pilot location (4800 ft. elevation) was generally underlain with sand and silty sand overlying granite bedrock. The depth to bedrock varied from 15 feet below the ground surface to 2.5 feet. Cobbles and boulders were present in the silty sands. No ground water was encountered in any of the borings. Drill borings data are presented in Appendix 4. Approximately ½ feet of topsoil was present along the side slopes of the drainage. Any topsoil encountered at the processing facility construction site would be stockpiled for future reclamation and facilities closure needs.

The results of recent geotechnical excavations at the site are also included as Appendix 1 of this document. These data, used in combination with the 1989 investigation, are the basis for the final engineering design and technical specifications.

The proposed pilot processing facility (described in more detail later in this document) would be trailer-mounted, and totally contained within the Thompson Mill tankage. The mill building would provide secondary containment for all the process fluids. The containment design is also discussed in more detail later in this document. As such, potential stability issues would be minimized. Previous geotechnical investigations of the site were conducted for the design of a 1500 tpd cyanide heap leach facility permitted in 1990 (Resource Mining Corporation, Centennial Mine Project). The proposed tailings storage facility designed for the DMM project (described in more detail later in this

document) utilized the previous geotechnical design report, and the results of recently conducted geotechnical investigations at the site.

According to the Uniform Building Code, the project is located in Seismic Zone 2B (Welch Engineering, Inc. 1990). Within a 200 kilometer radius of the site, Modified Mercalli Intensity V to VIII have occurred between 1852 and 1980 (NOAA and USGS, 1970, revised 1980) with the closest significant events both occurring in May of 1916. The first was a Modified Mercalli VII event in Boise about 20 kilometers west-northeast of the site on May 25, 1916.

Probabilistic estimates of maximum acceleration and velocity in rock for the project area were determined from the study by Algermissen and others (1983). The study used historic and geologic data (i.e. characteristics of Holocene and Quaternary faulting) to produce maps of acceleration and velocity for various time exposures at the 90% probability level of non-exceedences. The value of acceleration and velocity for the project site are shown below:

Exposure Time (Year)	Acceleration (% Gravity)	Velocity (cm/s)
10	4	<2
50	5	3
250	11	7

As shown above, there is a 90% probability that an acceleration of 0.04g and a velocity of <2 cm/s will not be exceeded in a 10 year period.

It is anticipated that soils derived from the tailings pond excavation will be used in construction of the perimeter berm. Screening of the cobbles and boulders will be required where they are encountered. Should material be imported, they would be imported locally (see detailed Technical Specifications, Appendix 1).

3.c Surface Water Drainage Characteristics

The proposed project lies at the headwaters to two primary drainages: Blacks Creek and Wood Creek. The Blacks Creek drainage encompasses approximately 1,229 acres (1.92 $mi.^2$). Elevations range from 5,324 feet at Three Point Mountain, to 4090 at the lower drainage point of the project area. All proposed processing facilities are located in this drainage.

Site observations for springs and seeps in the project area conducted in April of 1989 showed three springs located in the general area of the proposed Centennial small scale mineral processing facility. This survey was conducted in conjunction with the previously proposed 1500 tpd heap leach facility. Flows ranging from 1 to 5 gallons per minute were estimated for the springs and seeps.

A survey of the springs in August of this year showed no water flowing in any of the springs in the area of the Daisy Fraction/Overlook claims. These claims are the location

for the DMM processing facilities. The sites of the 1989 springs and local surface water are shown in Figure 7, Local Surface Water Springs and Seeps, and Ground Water Monitoring Sites.

During the 1989 springs and seeps inventory, the general project area was also surveyed using the U.S. Army Corps of Engineers Wetlands Delineation Manual. It is noted that the areas around the springs and seeps inventoried did not support hydrophytic plant species, and did not contain hydric soils. None of these sites are in the area of the Daisy/Overlook claims. Larger streams in the project area were also inventoried, and stream flow measurements were collected in 1989. Flows in April ranged from 42.8 gallons per minute (gpm) at surface water Site 2 (SW-2) above Don's Mine (see Figure 7) in the west fork of Blacks Creek, to approximately 1,900 gpm at SW-5 in Wood Creek near the road crossing. Both these sites had no flow during the DMM August, 2004 site visit.

Surface water flow in the local drainages originates from runoff and springs. Initial water quality monitoring results from 8 monitoring stations measured during the 1989 and 1990 sampling program showed water of a calcium sulfate type, with pH ranging from 6.2 to 7.6 units. Water quality analyses are included as Appendix 5.

These results are consistent with water quality sampling conducted later that year. This sampling occurred generally monthly, or every other month due to dry conditions in the summer and late fall and no water flows being measurable. No significantly elevated concentrations or trends for water quality parameters of concern were observed in the sampling results during these sampling events.

A surface water quality program is planned to be re-started for the DMM project during winter 2004, once precipitation events begin to occur. This will serve to provide additional baseline characterization for future small-scale or full-scale mining and processing operations. Figure 7 also shows four (4) new DMM proposed water quality monitoring locations. This program will commence when stream flows resume, probably in November or December 2004. Quarterly flows will be sampled from the 4 sites. The focus will be on documenting winter and spring water quality, as required by the existing stream regime.

3.d Ground Water Characteristics In Mineral Processing Facility Location

Geologic characteristics of the general project area are well known. These characteristics have been documented as a result of previous mining activities and drilling exploration. Geologic formations present in the area are not considered significant aquifers. No known wells for drinking water exist within 5 miles of the project site. Drill hole water levels from 35 exploration logs surveys showed water level depth at 11-98 ft. throughout the general area

Previously, a ground water monitoring program was also initiated in 1989. Two (2) monitoring wells were installed in September of that year just south of the DMM

processing plant site. A site was also established to measure water quality flowing from the mine adit. In 1990, GW-B was installed. This well is in the southwest corner of the Daisy/Overlook claims where the DMM facility would be located.

Initially, water level readings were taken in the ground water wells over about a 12-month period. Five boreholes were also drilled in the area where Resource Mining Corporation previously proposed to locate the leach pad. This is the general area being considered by DMM to locate a small, less than 10,000 ton waste rock storage site . The waste rock storage site will be used to backfill the mining blocks or "slot cut" mine sites in the mining sequence. The results were discussed earlier in this document.

The geology in this area consists of exposures of granites and grandiorites of the Idaho Batholith. Depth to bedrock is shallow, typically 1 to 5 feet, covered with a thin veneer of silty sand to slightly clayed sand colluvium. The lower lying areas also tend to contain dark gray to black topsoil, typically 12-30 inches in depth.

Borehole drilling in the general area where DMM currently plans to locate the small scale processing facility and tailings impoundment showed the area to be underlain with sand and silty sand overlying granitic bedrock. The depth to bedrock varied from 2.5 to 15 feet. Cobbles and boulders were present in the silty sands. Weathered granite bedrock layers ranged from 2 to 4 feet, as shown in the borehole logs. No significant hazards were identified that might interfere with pilot plant construction or operation.

DMM collected a ground water sample from the GW-B monitoring well in August of this year. Water quality results are included as Appendix 5 of this document. Water quality is generally good; no issues exist with regard to metals of concern. DMM will collect additional ground water quality data during winter and spring of 2005 to expand the baseline database and provide a statistically sound representation of operating conditions at the site. These sampling events will coincide with the winter/spring hydrographs for the area.

Construction materials identified in the 1989/1990 studies at the site as part of this geotechnical investigation were typically from two areas:

- silty sand or clayey sands from the colluvial soils found above the weathered granitic bedrock surface; and

- waste material to be available from stripping of the full-scale open mining operation, or from the excavation for the future proposed leach pad site.

This was confirmed in the recent geotechnical investigation at the site where the tailings impoundment would be located (see Appendix 1). Six pits were excavated by a backhoe. The results of the investigation were used to develop the overall design concept for the project.

Groundwater was encountered during the earlier site investigation in all the borings located in the alluvial materials in the valley floor below the DMM site, at depths ranging from 7 to 11 feet below the existing ground surface. Outside the alluvial "floor", colluvial soils on slight slopes were found to be dry. The water that does occur in the alluvium is considered to be perched (Geowest, 1989). No shallow groundwater was encountered in the test pit excavations.

3.e Leachate Analysis (Non-Ore Characterization)

The geochemistry of the non-ore rock (all processed ore to be contained with no exposure to surface runoff) was evaluated as part of the initial Centennial permitting program earlier in 1990. Leachate tests were conducted to determine whether certain chemical species may leach out of the waste rock exposed to meteoric water from rain or snowmelt. The method of "artificial" leaching used for this study was the ASTM Method D3987, "Shake Extraction of Solid Waste with Water". This method is considered an accurate screening leach test, for the purpose of the proposed DMM pilot-scale program.

Analytical results are included as Appendix 6. Six (6) samples were analyzed. These are considered representative of the major waste rock types that would be encountered in a pilot-scale mining scenario at the Centennial mine. Values for metals of concern (antimony, arsenic, chromium, copper, lead, mercury, nickel and selenium) were all considered low, and would pose no threat to surface water or ground water quality, as a result of proposed pilot processing activities.

No acid-forming potential was observed for the waste materials tested. The pH values for the 6 samples ranged from 6.2 to 8.8 for the shake extraction procedure.

Cyanide leach tests were also performed on 10 representative bulk samples of ore from the Centennial Mine in 1989. Each of the samples consisted of one 55-gallon drum weighing about 250 kilograms. Samples were tested by Kappes, Cassiday and Associates in Sparks, Nevada.

Seven cyanide column leach tests were conducted on run-of-mine and minus 1 ½ inch crushed ore. One sample was agglomerated. All column tests added hydrated lime. Recoveries ranged from 93 to 98.8 percent. Sodium cyanide consumption averaged 1.06 pounds per tons of ore.

Overall, results for the testwork are assumed to be generally representative of recoveries and process chemical consumption needs, except that the Thompson Mill has demonstrated better efficiencies and more rapid gold recovery time in trial processing tests. Washing test results for the 1989 heap leach proposal, included as Appendix 7, show effective reductions in WAD cyanide concentrations and other key constituents over time.

The washing procedure involved applying fresh water to the column at a an estimated flow rate of 0.005 gpm/ft.^{2} of surface area. The final wash solution was submitted to an

outside environmental laboratory for water quality analyses. Appendix 7 shows low residual WAD cyanide for the tests (0.11 and 0.007 mg/l), and low values for all metals of concern.

Other test results conducted for the proposed 1989 cyanide leaching operation showed that recovery improved as grain size decreased. This is consistent with the design criteria used for the Thompson Mill. DMM intends to treat spent ore using sodium hypochlorite prior to discharge to the tailings facility.

During the initial 30-day startup period, DMM will analyze spent ore for TCLP constituents on a weekly basis (7 samples), and submit the results to IDEQ. Thereafter, one (1) monthly analysis will be performed. This is consistent with DMM's desire to evaluate the feasibility of potentially using treated spent ore for other commercial compost manufacturing applications.

DMM will also analyze the effluent for nitrate (as NO_2+NO_3) and weak acid dissociable (WAD) cyanide concentrations, as well as key metals indicator parameters, as part of the monthly sampling program. Metal constituents would include: arsenic, iron, copper and silver (see Leachate Analyses, ACZ, Inc., 1989; and Column Leach Tests, Kappes Cassiday, 1989).